

Woojin Choi

Department of Electrical and Computer Engineering (ECE),
Jacobs School of Engineering, UC San Diego (UCSD),
9500 Gilman Drive, La Jolla, CA, 92093, United States

Mobile: +1-858-750-5208

E-mail: cwj14@eng.ucsd.edu



EDUCATION

2015 ~ present

University of California San Diego, CA, United States of America

Ph.D. student in Electrical and Computer Engineering

GPA : 3.66/4.0

Advisor: Prof. Shadi A. Dayeh

(Integrated Electronics and Bio-interfaces Lab. [<homepage>](#))

2011 ~ 2013

Seoul National University, Seoul, Republic of Korea

M.S. degree in Electrical Engineering and Computer Science

GPA : 3.98/4.3 (converted GPA 3.86/4.0)

Advisor: Prof. Kwang-Seok Seo

(Millimeter-wave Devices and Circuits Lab. [<homepage>](#))

2005 ~ 2011

Hongik University, Seoul, Republic of Korea

B.S. degree in Electronic and Electrical Engineering

GPA : 4.05/4.5 (converted GPA 3.68/4.0)

Advisor: Prof. Ho-Young Cha

EXPERIENCES

Oct. 2013

~Feb. 2014

Inter-university Semiconductor Research Center (ISRC),

Seoul National University, Seoul, Republic of Korea

Research Fellow

2005 ~ 2007

Military Service, Republic of Korea

Administrative Soldier

RESEARCH

- **Master Degree Research**

Thesis: *A Study on Gate Insulator of AlGaN/GaN MIS-HEMTs for High Power Devices*

Projects:

- Development of Schottky and Ohmic process for GaN power device (grant funded by Samsung Advanced Institute of Technology Co.)
- Development of GaN/Si nano-energy devices for Green IT (grant funded by the Ministry of Science, ICT and Future Planning, Korea government)

- **Current & Future Research Interests**

- Process development (especially ALD and CVD for gate insulator)
- Device design and characterization of compound semiconductor
- Power electronics and energy conversion
- Nano-devices and nano-fabrication

PUBLICATIONS

- **Journal Articles**

- Neung-Hee Lee, Minseong Lee, **Woojin Choi**, Donghwan Kim, Namcheol Jeon, Seonhong Choi, and Kwang-Seok Seo, "Effects of various surface treatments on gate leakage, subthreshold slope, and current collapse in AlGaN/GaN high-electron-mobility transistors," *Japanese Journal of Applied Physics*, Vol. 53, No. 4S, pp. 04EF10-1–04EF10-5, April 2014.
- **Woojin Choi**, Ogyun Seok, Hojin Ryu, Ho-Young Cha, and Kwang-Seok Seo, "High-voltage and low-leakage-current gate recessed normally-off GaN MIS-HEMTs with dual gate insulator employing PEALD-SiN_x/RF-sputtered-HfO₂," *IEEE Electron Device Letters*, Vol. 35, No. 2, pp. 175-177, February 2014.
- **Woojin Choi**, Hojin Ryu, Namcheol Jeon, Minseong Lee, Ho-Young Cha, and Kwang-Seok Seo, "Improvement of V_{th} instability in normally-off GaN MIS-HEMTs employing PEALD-SiN_x as an interfacial layer," *IEEE Electron Device Letters*, Vol. 35, No. 1, pp. 30-32, January 2014.
- Bong-Ryeol Park, Jae-Gil Lee, **Woojin Choi**, Hyungtak Kim, Kwang-Seok Seo, and Ho-Young Cha, "High-quality ICPCVD SiO₂ for normally off AlGaN/GaN-on-Si recessed MOSHFETs," *IEEE Electron Device Letters*, Vol. 34, No. 3, pp. 354-356, March 2013.

- **Conference Papers**

- **Woojin Choi (oral presentation)**, Hojin Ryu, Namcheol Jeon, Minseong Lee, Neung-Hee Lee, Ho-Young Cha, and Kwang-Seok Seo, "Impacts of conduction band offset and border traps on V_{th} instability of gate recessed normally-off GaN MIS-HEMTs," *26th IEEE International Symposium on Power Semiconductor Devices and ICs (ISPSD)*, pp. 370-373, Hawaii, 2014.

- **Woojin Choi (oral presentation)**, Hojin Ryu, Ogyun Seok, Minseok Kim, Ho-Young Cha, and Kwang-Seok Seo, "High-performance normally-off GaN MIS-HEMTs with dual gate insulator employing PEALD SiN_x interfacial layer and RF-sputtered HfO₂," *International Conference on Compound Semiconductor Manufacturing Technology (CS ManTech)*, pp. 149-152, Denver, 2014.
- Neung-Hee Lee, **Woojin Choi**, Minseong Lee, Seonhong Choi, and Kwang-Seok Seo, "The effect of SF₆ plasma and *in-situ* N₂ plasma treatment on gate leakage, subthreshold slope, and current collapse in AlGaIn/GaN HEMTs," *International Conference on Compound Semiconductor Manufacturing Technology (CS ManTech)*, pp. 245-248, Denver, 2014.
- Hojin Ryu, **Woojin Choi**, Namcheol Jeon, Ho-Young Cha, and Kwang-Seok Seo, "Improvement of hysteresis behavior in AlGaIn/GaN MIS-HEMTs with SiN_x using NH₃," *International Conference on Solid State Devices and Materials (SSDM)*, Fukuoka, 2013.
- Namcheol Jeon, **Woojin Choi**, Hojin Ryu, Ho-Young Cha, and Kwang-Seok Seo, "Fully recessed Schottky barrier diodes with a digital etching on AlGaIn/GaN heterostructures," *International Conference on Solid State Devices and Materials (SSDM)*, Fukuoka, 2013.
- Namcheol Jeon, Hojin Ryu, **Woojin Choi**, Ho-Young Cha, and Kwang-Seok Seo, "AlGaIn/GaN-on-Si rectifier with a combined anode of recessed and non-recessed Schottky contacts," *International Conference on Nitride Semiconductors (ICNS)*, Washington, 2013.
- **Woojin Choi (oral presentation)**, Hojung Ahn, Namcheol Jeon, Ilhong Min, Ho-Young Cha, and Kwang-Seok Seo, "Enhancement mode AlGaIn/GaN MIS-HEMTs using optimized Si₃N₄ gate insulator," *International Conference on Solid State Devices and Materials (SSDM)*, Kyoto, 2012.
- Namcheol Jeon, **Woojin Choi**, Jae-Hoon Lee, Ki-Se Kim, Ho-Young Cha, and Kwang-Seok Seo, "Improved electrical characteristics of AlGaIn/GaN HEMT with *in-situ* deposited silicon carbon nitride cap layer," *International Conference on Solid State Devices and Materials (SSDM)*, Kyoto, 2012.
- Namcheol Jeon, **Woojin Choi**, Ilhong Min, Ho-Young Cha, and Kwang-Seok Seo, "Power Schottky barrier diodes with improved Schottky contacts on AlGaIn/GaN heterostructures," *International Conference on Solid State Devices and Materials (SSDM)*, Kyoto, 2012.

- **Patent**

Kwang-Seok Seo and **Woojin Choi**, "Forming method of HEMT gate insulating film," Korea Patent, registration No. 10-1517381, 2015.

SKILLS

- **Semiconductor Processing and Analyzing Equipment**

Mask layout (Cadence), mask aligners, evaporators, CVDs, plasma etchers, SEM, AFM, etc.

- **Measurement Equipment**

Semiconductor device analyzers (4155A, B1500A, B1505A, 4200-SCS, DIVA, etc.)

- **Simulation Tools**

SILVACO TCAD

MISCELLANEOUS

- The academic scholarship for high grade students in EEE department, Hongik University, 2008 Spring, Fall, 2009 Spring, Fall, 2010 Spring, Fall (consecutively 6 semester).
- The departmental fellowship in ECE department, UC San Diego, Sept. 2015 ~ Aug. 2016.